

Correlations in the Alkyl Substitution of Hydrogen in the Benzene Ring.IV. The Ratio Between the Constants of the Heat of Formation of Butyl Benzenes and the Equations for the Composition of the Products of Benzene Alkylation by n-Butylene in the Presence of Hydrogen Fluoride SOV/76-32-6-11/46

process and that the total amount of olefines was used up for the formation of the alkyl benzenes. The investigations showed that mono-sec- and di-sec-butylbenzenes are produced in the alkylation of benzene with n-butylene. The fraction of the latter primarily contains the para-isomer and a small amount of the meta-isomer. The modification of the composition of the alkylation products versus the molar ratio n is given graphically, and a good agreement with the theoretical curves is obtained. From the experimental data it may be seen, among other things, that benzene is twice as reactive as mono-sec-butylbenzene in the substitution reaction of the hydrogen atom in the benzene nucleus. There are 1 figure, 2 tables, and 2 references, which are Soviet.

ASSOCIATION: Ural'skiy filial Akademii nauk SSSR, Sverdlovsk (Sverdlovsk, Ural Branch, AS USSR)

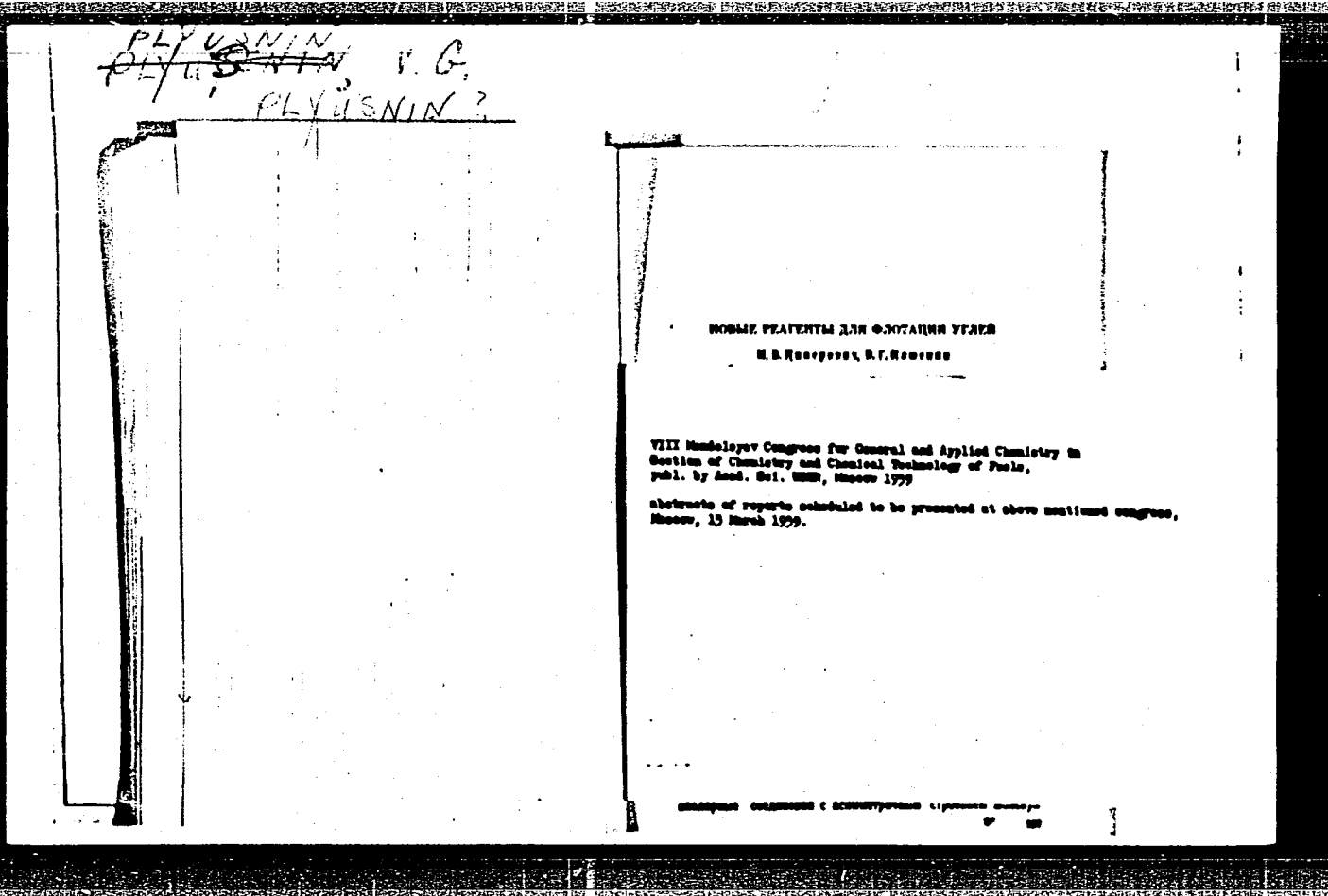
Card 2/3

Correlations in the Alkyl Substitution of Hydrogen 304/76-32-6-11/46
in the Benzene Ring. IV. The Ratio Between the Constants of the Heat of Formation
of Butyl Benzenes and the Equations for the Composition of the Products of
Benzene Alkylation by n-Butylene in the Presence of Hydrogen Fluoride

SUBMITTED: January 20, 1957

1. Benzenes--Chemical reactions
 2. Butenes--Chemical reactions
 3. Substitution reactions
 4. Butyl benzenes--Heat of formation
 5. Alkali radicals--Chemical reactions
 6. Hydrogen fluoride
- Chemical effects

Card 3/3



BABIN, Ye.P.; PLYUSHIN, V.G.; NASAKINA, M.I.

Alkylation of monoisopropylbenzene with propylene in the presence
of aluminum chloride. Izv.Sib.ots. AN SSSR no.1:72-75 '59.
(MIRA 12:4)

1. Ural'skiy filial AN SSSR
(Cumene) (Propene) (Alkylation)

BABIN, Ye.P.; PLYUSNIN, V.G.; ZELENTSOVA, M.I.; RODIGIN, N.M.

Reversible reactions in the alkylation of isopropylbenzene
by propylene. Izv.Sib.AN SSSR no.11:57-61 '59.
(MIRA 13:4)

1. Ural'skiy filial AN SSSR.
(Cumene) (Alkylation) (Propylene)

5.3300,5.1190

77865

SOV/79-30-2-16/78

AUTHORS: Babin, Ye. P., Plyusnin, V. G. , Alekseyeva, I. A.,
Nasakina, M. I., Alekseyeva, G. A.

TITLE: Dealkylation of Polyalkylbenzenes in the Presence of
Aluminum Chloride

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 2, pp 430-
435 (USSR)

ABSTRACT: The effect of temperature on the composition of final
products of dealkylation of polyisopropylbenzenes (over
 AlCl_3) is reported in this paper. Dealkylation experi-
ments were performed at 20, 40, 60, and 80° in a three-
neck round-bottom flask, provided with a spiral stirrer,
reflux condenser, and a bubbler for introducing dry
hydrogen chloride. 0.27 mole of AlCl_3 was used for
every mole of alkylbenzene. Reaction time: 6 hours.
The two layers, the upper hydrocarbon and the lower a
catalyst phase, were separated, washed with ice water,

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Dealkylation of Polyalkylbenzenes in the
Presence of Aluminum Chloride

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dilute HCl and again with water, and then fractionated. The analytical results show that: (1) In the dealkylation of monoisopropylbenzene, raising of temperature lowers the content of monoisopropylbenzene in the hydrocarbon layer (from 19.3% at 20° to 8.7% at 80°), while the content of benzene increases in both the hydrocarbon and (more so) in the catalyst layer. The rise in temperature also increases the ratio of the layers catalyst/hydrocarbon (from 1.8 at 20° to 3.6 at 80°) due to an increase in concentration of di- and triisopropylbenzenes (and of the polymeric products formed in the reaction) in the catalyst phase. (2) In case of diisopropylbenzene, a rise in temperature causes an increase in concentration of benzene, mono- and triisopropylbenzene, and also an increase of diisopropylbenzene in the hydrocarbon layer. Such apparent inconsistency is explained by increasing dealkylation of triisopropylbenzene (concentration of the latter in the catalyst layer decreases with rising temperature) which is formed during the process.

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(3) Dealkylation of triisopropylbenzene results in formation of benzene, mono- and diisopropylbenzene, the concentration of which increases with increasing temperature. The catalyst phases of the polyisopropylbenzenes contain a considerable quantity of unsaturated hydrocarbons, which increases with rising temperature. As in the case of mono- and diisopropylbenzenes, alkylation of triisopropylbenzene results in formation of polymerization products, the concentration of which increases with rising temperature. Comparing the investigated polyisopropylbenzenes, triisopropylbenzene is the most stable, while the mono-derivative is least stable in regard to dealkylation in the presence of aluminum chloride. Isomeric di- and triisopropylbenzenes were analyzed by taking their Raman spectra (taken on the ISP-51 spectrograph and measured with IZA-2 microscope and MF-2 microphotometer). The rise in temperature causes slight changes in meta- to para-isomer ratio (4-fold rise in temperature causes a 6% decrease in concentration of para-diisopropylbenzene, due to

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Dealkylation of Polyalkylbenzenes in the
Presence of Aluminum Chloride

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conversion into the meta-isomer). The triisopropylbenzene fractions obtained in all experiments contained only 1,3,5-triisopropylbenzene. There are 6 tables; and 20 references, 9 Soviet, 7 German, 1 Japanese, 2 U.S., 1 French. The U.S. references are: Norris, Rubinstein, J. Am. Chem. Soc., 61, 1167 (1938); H. Gilman, R. M. Meals, J. Org. Chem., 8, 126 (1943).

ASSOCIATION: Ural Branch of the Academy of Sciences, USSR (Ural'skiy filial Akademii nauk SSSR)

SUBMITTED: February 9, 1959

Card 4/4

68340

S/076/60/034/01/012/044
B008/B014

5-4) 5.3200

AUTHORS: Plyusnin, V. G., Babin, Ye. P.

TITLE: Rules of the Substitution of Alkyl Groups for Hydrogen Atoms
in the Benzene Nucleus
VI. The Problem of Equilibrium in the Process of Alkylation
of Benzene by Propylene in the Presence of Aluminum Chloride
and Hydrogen Fluoride

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol 34, Nr 1, pp 78-82 (USSR)

ABSTRACT: In this paper the authors investigated hydrofluoric alkylation with respect to the equilibrium and reversibility of this process at each individual stage of the successive substitution of alkyl groups for hydrogen atoms. Tables 1 and 2 indicate that the composition of the alkylates remains practically unchanged before and after the treatment with aluminum chloride or hydrogen fluoride with different molar ratios between olefin and benzene. The chemical equilibrium between the alkylation products is stabilized within the course of alkylation according to the amount of olefin entering the reaction vessel. The equilibrium composition of the alkylation products is determined only by the interaction between the

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Rules of the Substitution of Alkyl Groups for
Hydrogen Atoms in the Benzene Nucleus

S/076/60/034/01/012/044
B008/B014

VI. The Problem of Equilibrium in the Process
of Alkylation of Benzene by Propylene in the Presence of Aluminum Chloride
and Hydrogen Fluoride

reacting components with regard to the respective catalyst. Table 3 indicates that the distribution of the alkyl groups in the presence of aluminum chloride is an equilibrium process, which is, however, not reversible for all substances. An investigation of the dealkylation products showed that, with corresponding values of the molar ratios between olefin and benzene, they are similar to the alkylation products. A figure on p 80 shows curves representing the composition of the system during benzene alkylation with propylene at 60° in the case of different molar ratios. Table 4 contains the results of an investigation of products obtained after tetraisopropyl benzene had been treated with aluminum chloride and hydrogen fluoride. It may thus be concluded that in the reaction with aluminum chloride the first, second, and fourth stage of the successive alkylation are reversible. In the case of alkylation with hydrogen fluoride, however, only the fourth stage is reversible. A scheme is suggested for the two reactions. N. N.

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Rules of the Substitution of Alkyl Groups for
Hydrogen Atoms in the Benzene Nucleus

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B008/B014

VI. The Problem of Equilibrium in the Process
of Alkylation of Benzene by Propylene in the Presence of Aluminum Chloride
and Hydrogen Fluoride

Lebedev is mentioned in this paper. There are 1 figure, 4
tables, and 16 references, 8 of which are Soviet. ✓

ASSOCIATION: Ural'skiy filial Akademii nauk SSSR (Ural Branch of the
Academy of Sciences, USSR)

SUBMITTED: May 30, 1957

Card 3/3

688L6

5.3200

AUTHORS:

Plyusnin, V. G., Babin, Ye. P.,
Nasakina, M. I., Rodigin, N. M.

S/076/60/034/02/003/044
B010/B015

TITLE:

Laws of the Substitution of Hydrogen Atoms in the Benzene Nucleus by Alkyl Groups. VII. Ratio Between the Velocity Constants of the Formation of Isopropyl Benzene and Equations for the Composition of the Products of Benzene Alkylation by Propylene in the Presence of Aluminum Chloride

PERIODICAL:

Zhurnal fizicheskoy khimii, 1960, Vol 34, Nr 2, pp 267-271 (USSR)

ABSTRACT:

In previous papers (Refs 1-3) it was found that the benzene alkylation with propylene in the presence of hydrogen fluoride (as a catalyst) leads to a successive formation of mono-, di-, tri-, and tetraisopropyl benzene, with the reaction rate constants occurring in the following ratio: $k_1 : k_2 : k_3 : k_4 = 1 : 0.8 : 0.32 : 0.16$. In the present paper, this reaction was investigated in the presence of aluminum chloride (instead of hydrogen fluoride). Alkylation took place at $60 \pm 0.2^\circ$. Propylene was passed through a mixture of 0.03 mol of aluminum chloride per 1 mol of benzene at a constant velocity (about 300-330 l/h per 1 kg of benzene). Tables show the experimental results obtained (Tables 1,2). According to results of experiments and calculation, the ratio of the reaction

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Laws of the Substitution of Hydrogen Atoms in the Benzene Nucleus by Alkyl Groups. VII. Ratio Between the Velocity Constants of the Formation of Isopropyl Benzene and Equations for the Composition of the Products of Benzene Alkylation by Propylene in the Presence of Aluminum Chloride

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S/076/60/034/02/003/044
B010/B015

rate constants is as follows: $k_1 : k_2 : k_3 : k_4 = 1 : 0.58 : 0.24 : 0.015$. Tetraisopropyl benzene is the end product of benzene alkylation. The equations for the composition of the system investigated were calculated for various molar ratios of propylene benzene. With respect to the industrial production of monoisopropyl benzene it is found that less raw material is consumed if aluminum chloride is used as a catalyst instead of hydrogen fluoride, and that the reaction proceeds irreversibly in the presence of hydrogen fluoride, whereas it is reversible in the presence of aluminum chloride. There are 2 figures, 2 tables, and 15 references, 12 of which are Soviet.

ASSOCIATION: Ural'skiy filial Akademii nauk SSSR (Ural Branch of the Academy of Sciences, USSR)

SUBMITTED: September 25, 1957

Card 2/2

5.3200
5.3100

80224

S/076/60/034/04/04/042
B010/B009

AUTHORS: Alekseyeva, I. A., Plyusnin, V. G., Babin, Ye. P., Alekseyeva, G.A.
(Sverdlovsk)

TITLE: Laws Governing the Substitution of Alkyl Groups for the Hydrogen Atoms in the Benzene Ring. VIII. Orientation of the Alkyl Groups in the Catalytic Alkylation of Benzene With Acid Catalysts

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 4, pp. 726-733

TEXT: The investigation results quoted in various publications concerning the compositions of di- and polyalkyl benzenes (obtained with various catalysts) show that a higher percentage of 1,3-dialkylbenzenes may, for instance, be obtained by means of $AlCl_3$ and $FeCl_3$. Since alkyl groups preferably attach to the 1,2- and 1,4-positions in the aromatic ring, this is an "abnormal" phenomenon, which has not yet been explained. In the present paper benzene and isopropylbenzene were alkylated with propylene on kieselguhr in the presence of $AlCl_3$, HF , H_2SO_4 , and H_3PO_4 . The working methods have already been described (Refs. 11, 12), working conditions are given in Table 1. The catalyzates were

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for the Hydrogen Atoms in the Benzene Ring.
VIII. Orientation of the Alkyl Groups in the
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B010/B009

fractionated in narrow fractions whose Raman spectra were investigated by means of an ISP-51 spectrograph (Tables 2,3, results). The spectra of the mono- and diisopropylbenzenes were determined by means of the spectra of pure compounds (produced by the Komissiya po spektroskopii Akademii nauk SSSR (Commission of Spectroscopy of the Academy of Sciences USSR)). The diisopropylbenzene fraction of the catalyzate obtained by means of $AlCl_3$ contained, under the particular experimental conditions, the two isomers 1,3- and 1,4-diisopropylbenzene, the former being produced in larger quantities than the latter. Three isomers are obtained with the catalysts HF and H_2SO_4 , namely almost equal amounts of the 1,3- and 1,4-isomers and much less of the 1,2-isomer. The catalyzate obtained with the phosphorus catalyst also contained all three isomers (predominantly 1,3-diisopropylbenzene). It was found that in the course of the dealkylation of the mono- and diisopropylbenzenes an equilibrium of the isomers in the diisopropyl fraction comes about in accordance with the ratio 1,3-isomer : 1,4-isomer = 3 : 1. With $AlCl_3$ only 1,3,5-triisopropylbenzene forms, while the main reaction product in the case of HF and H_2SO_4 is

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ACC NR: AM6010602

Monograph

UR/

Plyushin, V. G.; Plotkina, N. I.; Chertkova, S. I.; Lysenko, A. P.; Geyn, N. V.; Varfolomeyev, D. F.

Processing of tars obtained in the pyrolysis of petroleum hydrocarbons (Pererabotka smoly piroliza neftyanykh uglevodorodov) [Sverdlovsk] Sredne-Ural'skoye knizhnoye izd-vo. 1965. 114 p. illus., biblio. Errata slip inserted. 1,200 copies printed. Series note: Akademiya nauk SSSR. Ural'skiy filial. Institut khimii. Trudy, vyp. 8

TOPIC TAGS: petroleum ~~refining~~ product, aromatic hydrocarbon, pyrolysis ~~tar, waste product~~, alkene, polymerization, *petroleum residue*, *petroleum refining*, *hydrocarbon*, *hydrocarbon resin*, *benzene*, *toluene*
 PURPOSE AND COVERAGE: This issue describes the development of a process for the refining of residue tars obtained from the pyrolysis of petroleum hydrocarbons in order to utilize this waste product as an additional source of aromatic hydrocarbons and other commercial products (from the conversion of the remaining unsaturated compounds). It was determined that unsaturated compounds contained in pyrolytic tars can be converted into solid polymeric resins which separate easily from aromatic hydrocarbons.

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ACC NR: AM6010602

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Ch. II. Acid-catalyst polymerization of unsaturated compounds obtained from light oils of pyrolytic tar -- 15

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Ch. VIII. Hydro- and dehydropolymerization of gaseous olefins and unsaturated compounds of cracking products -- 84

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Card 2/2 SUB CODE:1107/ SUBM DATE: 23Jul65/ ORIG REF: 049/ OTH REF: 010

LYSENKO, A.P.; YAKUNINA, G.I.; PLYUSHIN, V.G.; ZELENTSOVA, M.I.

Production of n-tert-butyl phenol by alkylation of phenol with
isobutylene in the presence of hydrogen fluoride. Khim. prom.
41 no. 12:887-891 D '65 (MIRA 1961)

PLYUSNIN, V.G.; MAKSIMOV, A.A.

Alkylation of bisphenyl by propylene. Zhur. prikl. khim. 35
no.5:1191-1192 May '66. (MIRA 18:11)

1. Institut khimii Ural'skogo filiala AN SSSR.

BUTINA, I.V.; PLYUSHIN, V.G.

Separation of phthalic acids based on various solubility
of their salts in alkaline solutions and in dioxane. Zhur.
prikl. khim. 38 no.5:1105-1109 My '65. (MIRA 18:11)

L 53888-65 ~~ENT(m)/EPA(s)-2/EPF(e)/EMP(j)~~ ~~Ps-1/Pt-1/Pt-7~~ RM

ACCESSION NR: AP5014169

UR/0080/65/038/005/1191/1192

547.638.1

AUTHOR: Flyusnin, V. G.; Maksimov, A.A.

TITLE: Alkylation of diphenyl with propylene 7

SOURCE: Zhurnal prikladnoy khimii, v. 38, no. 5, 1965, 1191-1192

TOPIC TAGS: alkylation, diphenyl, propylene, hydrofluoric acid, catalysis

ABSTRACT: Alkylation of diphenyl with propylene was studied using 98 to 99% HF and $AlCl_3$ as catalyst to find conditions for preparing a mixture of diphenyl with alkylation products in the liquid phase at room temperature. Such a liquid mixture could be used as a heat transfer medium. In the experiments with HF as catalyst, 400 ml of normal hexane solvent and 50 ml of 96 to 98% HF were used per 0.5 mol of diphenyl; the temperature was constant at 20°C, the molar ratio of propylene to diphenyl varied from 0.32 to 40, and the rate of propylene addition was 70 to 80 l/hr/kg of diphenyl. In the experiments with $AlCl_3$ as catalyst, no solvent was used, the temperature was constant at 80°C, 0.03 mole (or 40 g) of

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ACCESSION NR: AF5019169

aluminum chloride was used per mol of diphenyl, and the rate of propylene addition was 240 to 260 l/hr/kg of diphenyl. All reaction products were washed to neutral reaction. The solvent was removed by steam distillation. The oily products containing mono- and diisopropyldiphenols were twice distilled under atmospheric pressure. Low degree of unsaturation of the reaction products (up to a bromine number of 26.0) indicates parallel hydro-dehydropolymerization reactions. With 96 to 98% HF as catalyst an oily liquid product (at room temp.) results from a minimum molar ratio of propylene to diphenyl in the range from 0.8 to 1. With aluminum chloride as catalyst such products (oily liquids at room temp.) result from a minimum molar ratio of propylene to diphenyl in the range from 0.7 to 0.9. Orig. art. has: 1 table.

ASSOCIATION: Institut khimii ural'skogo filiala AN SSSR, (Institute of Chemistry, Ural Affiliate, AN SSSR)

SUBMITTED: 08Aug63

LNCL: 00

SUB CODE: GC

NO REF SOV: 005

OTHER: 006

Card 2/2

BUTINA, I.V.; PLYUSNIN, V.G.

Spectrophotometric determination of terephthalic acid in a
mixture with its isomers. Zav. lab. 30 no.7:794-796 '64.
(MIRA 18:3)

1. Institut khimii Ural'skogo filiala AN SSSR.

MOLCHANOVA, V.V.; PLYUSNIN, V.G.; ALEKSEYEVA, I.A.

Orienting effect in the methylation of benzene by methyl
chloride in the presence of aluminum chloride. Izv. Sib. otd.
AN SSSR no.3:80-83 '62. (MIRA 17:7)

1. Ural'skiy filial AN SSSR, Sverdlovsk.

BUTINA, I.V.; PLYUSNIN, V.G.; SHEVCHENKO, N.A.

Analysis of phthalic acids by water extraction. Izv. Sib. otd.
AN. SSSR no.6:68-77 '62 (MIRA 17:7)

1. Ural'skiy filial AN SSSR, Sverdlovsk.

BUTINA, I.V.; PLYUSNIN, V.G.; SHEVCHENKO, N.A.

Spectrophotometric determination of isomeric phthalic acids.
Zhur. anal. khim. 18 no.11:1384-1389 N '63. (MIRA 17:1)

1. Institut khimii Ural'skogo filiala AN SSSR, Sverdlovsk.

PLYUSNIN, V.G.; BABIN, Ye.P.; RODIGIN, N.M.; NASAKINA, M.I.

Regularities of the formation of isopropylbenzenes in the presence
of aluminum chloride. Trudy Inst.khim. UFAN SSSR no.4:3-20 '60.
(MIRA 16:6)

(Cumene) (Alkylation) (Aluminum chloride)

PLYUSNIN, V.G.; ALEKSEYEVA, I.A.; BABIN, Ye.P.

Orientation of isopropyl groups in a benzene ring during alkylation
by propylene catalyzed by AlCl_3 , HF, H_2SO_4 . Trudy Inst.khim. UFAN
SSSR no.4:49-58 '60. (MIRA 16:6)
(Benzene) (Propene) (Isopropyl group)

PLYUSNIN, V.G.; SUKHOROSOVA, T.I.

Regularities in benzene ethylation. Trudy Inst.khim. UFAN SSSR
no.4:21-32 '60. (MIRA 16:6)
(Benzene) (Ethylation)

PLYUSNIN, V.G.; VORFALOMEYEV, D.F.; LYSENKO, A.P.

Upgrading of highly unsaturated sulfur-bearing cracked distillates.
Trudy Inst.khim. UFAN SSSR no.4:85-94 '60. (MIRA 16:6)
(Petroleum--Refining)

BUTINA, I.V.; PLYUSNIN, V.G.

Oxidation of dialkyl derivatives of benzene to phthalic acids and
the separation of the latter. Trudy Inst.khim. UFAN SSSR no.4:
73-83 '60. (MIRA 16:6)
(Benzene derivatives) (Oxidation) (Phthalic acid)

PLOTKINA, N.I.; PLYUSNIN, V.G.

Alkylation of isobutane by olefins in the presence of hydrogen
fluoride. Trudy Inst.khim. UFAN SSSR no.4:59-71 '60. (MIRA 16:6)
(Propane) (Olefins) (Alkylation)

TSIPEROVICH, M.V.; PLYUSNIN, V.G.

Problem of selecting an efficient reagent for coal flotation. Trudy
Inst.khim. UFAN SSSR no.4:111-125 '60. (MIRA 16:6)
(Coal preparation) (Petroleum products)

LYSENKO, A.P.; PLYUSNIN, V.G.

Preparation of dialkyl benzenes by the alkylation of isopropylbenzene
with olefins in the presence of hydrogen fluoride. Trudy Inst.khim.
UFAN SSSR no.4:33-47 '60 (MIRA 16:6)
(Benzene derivatives) (Cumene) (Olefins)

SHIMANSKAYA, R.I.; PLYUSNIN, V.G.; VAYSBERG, N.S.

Use of pyrolysis tar from wastes of the synthetic alcohol
manufacture. Khim.i tekhn. topl.i masel 7 no.9:34-37 S '62.
(MIRA 15:8)

1. Ural'skiy filial AN SSSR.
(Petroleum products)

S/768/60/000/004/001/004
I060/I242

AUTHORS: Lysenko, A.P. and Plyusnin, V.G.

TITLE: Preparation of dialkylbenzenes by alkylation of isopropylbenzene with olefines in the presence of hydrogen fluoride

SOURCE: Akademiya nauk SSSR. Ural'skiy filial. Institut khimii. Trudy. no. 4. 1960. Sbornik rabot Laboratorii neftesinteza, 33-47

TEXT: The purpose of this study was to establish the exact relationship between the rate constants of formation of isopropylbenzenes and other dialkylbenzenes which are produced by oxidation of the industrially important phthalic, terephthalic, and isophthalic acids. The problem was subdivided into: 1) a study

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I060/I242

Preparation of dialkylbenzenes....

of the process of production of dialkylbenzenes by alkylation of (a) isopropylbenzene by propylene, (b) n - butylene, and (c) isobutylene, in the presence of hydrogen fluoride; 2) determination of a quantitative rule of substitution of hydrogen of the benzene nucleus by propylene groups during alkylation of isopropylbenzene; 3) determination of rules governing introduction of secondary and tertiary butylene groups into isopropylbenzene. From the experimental study of (a) the authors obtain formulae which can be used for calculation and control of the process of alkylation of benzene and isopropylbenzene by propylene under industrial conditions. The most favourable conditions for the production of dialkylbenzene exist when the molar relationship for every olefine used is: olefine/isopropylbenzene, $n = 0.3 - 0.5$. The increase of size and of branching complexity of the alkyl groups entering into isopropylbenzene increases the probability of formation of para-isomers of dialkylbenzenes. There are 3 figures and 9 tables.

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S/768/60/000/004/002/004
I060/I242

AUTHORS: Plyusnin, V.G., Alekseyeva, I.A., and Babin, Ye, P.

TITLE: Orientation of isopropyl groups in the benzene cycle during catalytic alkylation by propylene over AlCl_3 , HF, H_2SO_4

SOURCE: Akademiya nauk SSSR. Ural'skiy filial. Institut khimii. Trudy. no. 4. 1960. Sbornik rabot Laboratorii neftesinteza, 49-58

TEXT: Various authors have published conflicting data on this subject. The spectra of combined dispersion of triisopropylbenzene are not described in literature. 1,2,4 and 1,3,5 - triisopropylbenzenes were separated from alkylates and their

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S/768/60/000/004/002/004
IC60,1242

Orientation of isopropyl...

spectra of combined light dispersion were studied. The spectra were photographed on a glass triprismal spectrograph MCTI -51 (ISP-51) on plates with a sensitivity of 45 units GOST. It is possible to determine by this method the composition of alkylates obtained by alkylation of benzene by propylene in the presence of $AlCl_3$, HF, H_2SO_4 , and a phosphate catalyst. In the alkylation over $AlCl_3$ the diisopropylbenzene fraction contains only two isomers - 1,3 and 1,4 - diisopropylbenzene, with the predominance of the former; the triisopropylbenzene fraction of the alkylate consists of 1,3,5 - triisopropylbenzene. When alkylating with HF and H_2SO_4 , the diisopropylbenzene fraction contains all the three isomers with the predominance in approximately equal amounts of 1,3 and 1,4 isomers, whilst the main product of the triisopropylbenzene fraction is

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1060/I242

Orientation of isopropyl...

1,2,4 - triisopropylbenzene. The diisopropylbenzene fraction obtained with phosphate catalyst contains all the three isomers, the 1,3 - isomer being predominant. Through action of AlCl_3 on mono- and diisopropylbenzenes an equilibrium solution is formed of isomers in the diisopropylbenzene fraction in which the proportion between the 1,3 and the 1,4 isomers is three to one. The triisopropylbenzene fraction consists of 1,3,5 - triisopropylbenzene. Unlike the mono- and diisopropylbenzenes, symmetrical triisopropylbenzene does not undergo dealkylation in the presence of small amounts of AlCl_3 . When alkylating with AlCl_3 , a composition in equilibrium is formed only when alkylbenzenes differ in the number of alkyl groups. No equilibrium solution of isomers of diisopropylbenzene has been obtained. There are 5 tables. The most important English-language reference is A.W. Francis, Chem.Rev.,(1948),43,257.

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S/768/60/000/004/003/004
I060/I242

AUTHORS: Butina, I.V. and Plyusnin, V.G.

TITLE: Oxidation of dialkyl derivatives of benzene to
phthalic acids and their separation

SOURCE: Akademiya nauk SSSR. Ural'skiy filial. Institut
khimii. Trudy. no.4. 1960. Sbornik rabot
Laboratorii neftesinteza, 73-83

TEXT: Oxidation was performed on diisopropylbenzenes
obtained by alkylation with hydrogen fluoride. *Their* composition,
determined spectroscopically, was: phthalic acid 15%, isophthalic
acid 40-42%, and terephthalic acid 43-45%. The optimum conditions
for oxidation at normal pressure and boiling point temperature
were found to be a 40-45% excess of HNO_3 , a 12-15 hrs reaction time, ✓

Card 1/2

Oxidation of dialkyl derivatives..

S/768/60/000/004/003/004
IO60/I242

a 32-42% concentration of HNO_3 . The optimum conditions for oxidation under pressure are a temperature of 140-150°C, a 3.5 -4 hrs reaction time, a terminal pressure of 45-50 atm, a 32-37% concentration of HNO_3 . The efficiency was lower at high pressure.

Separation of phthalic acids can be achieved either by separation of various dialkylbenzenes prior to oxidation or by separation of the oxidation products. The first method is extremely complex, the second one, based on different solubility of ammonium and calcium salts of isomeric phthalic acids in water, is discussed. There are 4 figures and 5 tables.

Card 2/2

3/768/66/000/004/004/004
1060/1242

AUTHORS: Plyusina, V.G., Vorfalomeyev, D.F., and Lyseiko, A.P.
TITLE: Refinement of highly unsaturated sulphurous distillates of the cracking of petroleum
SOURCE: Akademiya Nauk SSSR. Ural'skiy filial. Institut Khimii. Trudy. no.4. 1960. Sbornik rabot Laboratorii neftesinfeza, 35-94

TEXT: The purpose of this work is to study the best method of increasing stability and of desulfurization of cracking products of heavy residues. The various existing methods are unsuitable. The method of hydro-dehydropolymerization, where hydrogen required for hydrogenation of unsaturated and sulfur compounds is obtained by dehydrogenation of a fraction of crude oil is suggested, with hydrogen fluoride as catalyst. The latter is completely eliminated from the resulting hydropolymers by distillation. The combined alkyl fluorides are partly eliminated by distillation and the remainder by thermal destruction over granulated CaF_2 and by the absorption of the hydrogen fluoride formed by bauxite or lime. The hydro-dehydropolymerization method is superior to the hydrogenation method as it requires a simple installation and no hydrogen. The yield of hydropolymers varies 30-93% in relation to the amount

Card 1/2

S/768/60/000/004/004/004
1060/1042

Refinement of highly...

of unsaturated compounds in the crude. They contain no sulfur and are characterized by a low freezing point. Dehydropolymers combined with the catalyst can be easily separated by heating, with subsequent recovery of the hydrogen fluoride. Dehydropolymers are actually olofines with two or three double bonds and can be used as artificial drying oils. There are 6 figures and 6 tables. ✓

Card 2/2

MOLCHANOVA, V.V.; PLYUSNIN, V.G.

Effect of the quantity of aluminum chloride on the reaction of
benzene methylation. Izv.Sib.otd.AN SSSR no.1:83-88 '62.
(MIRA 153)

1. Ural'skiy filial AN SSSR, Sverdlovsk.
(Benzene) (Methylation) (Aluminum chloride)

S/595/60/000/000/003/014
E075/E435

AUTHORS: Butina, I.V., Plyusnin, V.G.

TITLE: Oxidation of dialkyl derivatives of benzene to phthalic acids and their separation

SOURCE: Vsesoyuznoye soveshchaniye po khimicheskoy pererabotke neftyanykh uglevodorodov v poluprodukty dlya sinteza volokon i plasticheskikh mass. Baku, 1957. Baku, Izd-vo AN Azerb. SSR, 1960. 131-171

TEXT: The aim of the work was to investigate the process of oxidation of diisopropylbenzenes with nitric acid and separation of the resulting phthalic acids. In particular, it was desired to find the optimum conditions of the oxidation process in relation to temperature, time of reaction, concentration of HNO_3 , and additions of NH_4VO_3 as catalyst. The oxidations were carried out 1) under normal pressures and 2) under pressures of 40 to 50 atm. It was found that the best conditions for the first method are as follows: excess HNO_3 (theoretical): 40 to 45%; time of oxidation: 12 to 15 hours; concentration of HNO_3 : 32 to 42% ($d = 1.2$ to 1.26). It was noticed that small additions of

Card 1/4

Oxidation of dialkyl ...

S/595/60/000/000/003/014
E075/E435

NH_4VO_3 to nitric acid decrease the reaction time from 18 - 20 h to 10 - 12 h, and increase the yield of phthalic acids from 60 - 62% to 79 - 82%. The nitric acid can be used repeatedly up to 5 to 6 times, its concentration being brought up to the required level after each oxidation cycle. The presence of secondary products of reaction, such as nitro-compounds, slows down the oxidation process. The accumulation of the reaction byproducts in nitric acid does not permit to use it for more than six oxidation cycles. The best conditions for the oxidations under pressure are as follows: temperature: 140 to 145°C; excess HNO_3 (theoretical): 40 to 45%; time of reaction: 3.5 to 4 hours; final reaction pressure: 45 to 50 atm; concentration HNO_3 : 32 to 37%. Comparative oxidation of different dialkyl derivatives of benzene with HNO_3 was carried out under the optimum conditions established for the oxidation of diisopropylbenzenes both under normal and elevated pressures (40 to 50 atm). Catalyst (NH_4VO_3) was used in a quantity of 0.002 mols for every mole of oxidized hydrocarbon. The best yields of phthalic acids (77 to 83%) were obtained from p-cymene, diisopropylbenzene, diethylbenzene and isopropylsec-butylbenzene. Xylenes give lower yields: m-xylene 35%,
Card 2/4

Oxidation of dialkyl ...

S/595/60/000/000/003/014
E075/E435

p-xylene 57%). Substituted benzenes containing tertiary alkyl groups are not easy to oxidize and give poor yields. In order to separate the phthalic acids, the differing solubilities of their ammonium, calcium and barium salts were utilized (Ref. 1: Dobryanskiy A.F. and Obolentsev, R. DZhOKh, 8, 1938, 1810). The acids were dissolved in 6% ammonia solution. Terephthalic acid forms the least soluble salt. When the three isomeric acids (ratio 1:1:1) were dissolved in the ammonia solution, 80% of the terephthalic acid present in the mixture precipitated out. The precipitate is contaminated with isophthalic acid if excess NH_3 is used. However, the latter acid can be separated via its calcium or barium salt. The best separation of isophthalic acid can be effected by adding 150% excess calcium chloride to the dissolved ammonium salt, with the amount of water in the solution being not less than 75 g per 1 g of isophthalic acid. The separation of terephthalic and phthalic acid by this method was not satisfactory, both acids coming out of solution as their calcium salts. Losses of the acids during the separation are mainly those of phthalic acid which is the most soluble of the three acids. The results can be briefly summarized as follows:

Card 3/4

Oxidation of dialkyl ...

S/595/60/000/000/003/014
E075/E435

- 1) It was shown that HNO_3 oxidation of alkyl benzenes and, in particular, diisopropylbenzenes gives an overall yield of 75 to 82% of isomeric phthalic acids.
 - 2) Terephthalic acid can be isolated from the mixture of the isomeric acids in good yield via its ammonium salt.
- A.F.Dobrinksiy and R.D.Obolentseva are mentioned for their contributions in this field. There are 4 figures, 5 tables and 14 references: 5 Soviet-bloc and 9 non-Soviet-bloc. The four most recent references to English language publications read as follows: Ref.9: Egan C.I., Luthy R.V. Industr. Engng. Chem. v.47, no.2, 1955, 250; Ref.10: Haines H.W., Powers I.M., Bennett R. Industr. Engng. Chem., 47, no.6, 1955, 1096; Ref.11: Mayor J. Ind. Chem., v.42, no.461, 1955, 387-390. Ref.12: Paint. Oil Chem. Rev., 118, no.3, 10, 12, 14-17, 1955.

Card 4/4

PLYUSNIN, V.G.; BABIN, Ye.P. (Sverdlovsk)

Laws governing the substitution of alkyl groups for hydrogen atoms in the benzene nucleus. Part 6: Equilibrium in the processes of alkylation of benzene by propylene in the presence of aluminum and hydrogen fluorides. Zhur.fiz.khim. 34 no.1: 78-82 Ja '60. (MIRA 13:5)
(Alkylation) (Propene) (Benzene)

PABLOV, P.H.; DIYEV, N.P. [deceased]; PLYUSNIN, V.G.

Effect of solutions of certain inorganic and organic substances
on the rate of sulfide ore oxidation. Trudy Inst. met. UFAN SSSR
no. 3:9-14 '59. (MIRA 13:4)
(Sulfides) (Oxidation)

PLYUSNIN, V.G.; BABIN, Ye.P.; NASAKINA, M.I.; RODIGIN, N.M.

Correlations in the substitution of hydrogen atoms by alkyl groups in the benzene nucleus. Part 7: Relationship between the rate constants for the formation of isopropylbenzenes and the equation for the composition of the products from the alkylation of benzene by propylene in the presence of aluminum chloride. Zhur. fiz. khim. 34 no.2:267-271 F'60. (MIRA 14:7)

1. Ural'skiy filial AN SSSR.
(Alkylation) (Benzene)

ALEKSEYEVA, I.A. (Sverdlovsk); PLYUSNIN, V.G. (Sverdlovsk); BABIN, Ye.P.
(Sverdlovsk); ALEKSEYEVA, G.A. (Sverdlovsk)

Laws governing the substitution of alkyl groups for hydrogen atoms
in the benzene nucleus. Part 8: Orientation of the alkyl groups
in the catalytic alkylation of benzene in the presence of acid
catalysts. Zhur. fiz. khim. 34 no.4:726-733 Ap '60.---
(MIRA 14:5)

1. Ural'skiy filial AN SSSR, Institut khimii.
(Alkylation) (Substitution (Chemistry))

S/076/60/034/007/010/042/IX
B004/B068

AUTHORS: Babin, Ye. P., Plyusnin, V. G., Nasakina, M. I., and
Rodigin, N. M.

TITLE: Laws Valid for the Substitution of Alkyl Groups for Hydrogen
Atoms on the Benzene Nucleus. X. Relation Between the Rate
Constants of the Formation of Isopropyl Benzene, and
Equations for the Composition of the Alkylation Products of
Isopropyl Benzene by Means of Propylene in the Presence of
Aluminum Chloride

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 7,
pp. 1389-1394

TEXT: In a previous work (Ref. 1), the authors pointed out that the al-
kylation of benzene with propylene is a consecutive reversible reaction.
Reverse reactions take place in the first, second, and fourth stages of the
complete reaction. From this result, the conclusion is drawn that benzene
must form as the dealkylation product when the alkylation of isopropyl
benzene is carried out with propylene. The aim of this paper is to

Card 1/6

Laws Valid for the Substitution of Alkyl
Groups for Hydrogen Atoms on the Benzene
Nucleus. X. Relation Between the Rate Constants
of the Formation of Isopropyl Benzene, and
Equations for the Composition of the Alkylation
Products of Isopropyl Benzene by Means of
Propylene in the Presence of Aluminum Chloride

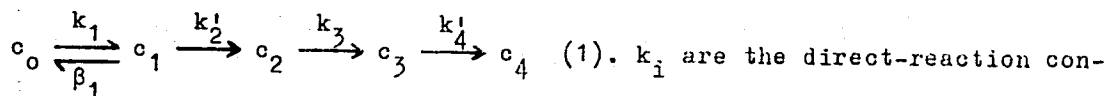
S/076/60/034/007/010/042/XX
B004/B068

determine the relation between the rate constants of the direct and the reverse reaction, as well as to find out whether the relation between the alkylation constants of benzene corresponds to the relation between the alkylation constants of isopropyl benzene. For this reason, the alkylation of isopropyl benzene was carried out in the presence of AlCl_3 with dry propylene in nitrogen. The flow rate of propylene varied between 200 and 250 l/h per kg of isopropyl benzene. The reaction products obtained were rectified. The composition of the fractions with different propylene - isopropyl benzene ratios is given in two tables. Analyses were performed by I. A. Alekseyeva and G. A. Semerneva. It may be seen from these data that at 60°C not only the formation of di-, tri-, and tetraisopropyl benzene but also of benzene takes place. The reverse reaction in the first stage was thereby confirmed. The alkylation reaction is represented by the following scheme:

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Laws Valid for the Substitution of Alkyl
Groups for Hydrogen Atoms on the Benzene
Nucleus. X. Relation Between the Rate Constants
of the Formation of Isopropyl Benzene, and
Equations for the Composition of the Alkylation
Products of Isopropyl Benzene by Means of
Propylene in the Presence of Aluminum Chloride

S/076/60/034/007/010/042/XX
3004/B068



stants; $i = 1, 2, 3, 4$; β_1 is the reverse-reaction constant. Since the de-alkylation of di- and tetraisopropyl benzene has not been considered, k'_2 and k'_4 are "summational constants" which refer both to the direct and reverse reaction. With k_3 , the dealkylation of triisopropyl benzene may be neglected. From an equation given in Ref. 13 for consecutive reversible reactions, the following ratios were found: $\beta_1:k_1:k'_2:k_3:k'_4 = 0.38:1:0.20:0.065:0.003$. The equations for the composition of the alkylation products are given as: $c_0 = 38[0.769 \exp(-0.14kt) - 0.769 \exp(-1.44kt)]$;

$$c_1 = 66.16 \exp(-0.14kt) - 33.85 \exp(-1.44kt);$$

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Laws Valid for the Substitution of Alkyl
Groups for Hydrogen Atoms on the Benzene
Nucleus. X. Relation Between the Rate Constants
of the Formation of Isopropyl Benzene, and
Equations for the Composition of the Alkylation
Products of Isopropyl Benzene by Means of
Propylene in the Presence of Aluminum Chloride

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B004/B068

$$c_2 = 20[9.066 \exp(-0.065kt) - 8.820 \exp(-0.14kt) + 0.246 \exp(-1.44kt)];$$

$$c_3 = 1.3[80.38 \exp(-0.003kt) - 143.9 \exp(-0.065kt) + 64.38 \exp(-0.14kt) - 0.171 \exp(-1.44kt)];$$

$$c_4 = 100 - \sum_{i=0}^3 c_i \quad (4). \text{ Fig. 2 shows the proportion by weight of the com-}$$

ponents with different initial molar ratios n . It is thus shown that there is good agreement between values calculated from (4) and those found experimentally. These values are compared with those established for the alkylation of benzene (data given in Refs. 11 and 14). The relation between the consecutive reversible reaction rate constants for the alkylation of isopropyl benzene differ only little from the relation between the consecutive alkylation rate constants for benzene with propylene under comparable experimental conditions. There are 2 figures, 3 tables, and Card 4/6

Laws Valid for the Substitution of Alkyl
Groups for Hydrogen Atoms on the Benzene
Nucleus. X. Relation Between the Rate Constants
of the Formation of Isopropyl Benzene, and
Equations for the Composition of the Alkylation
Products of Isopropyl Benzene by Means of
Propylene in the Presence of Aluminum Chloride

S/076/CO/034/007/010/042/XX
B004/B068

14 references: 11 Soviet, and 3 US.

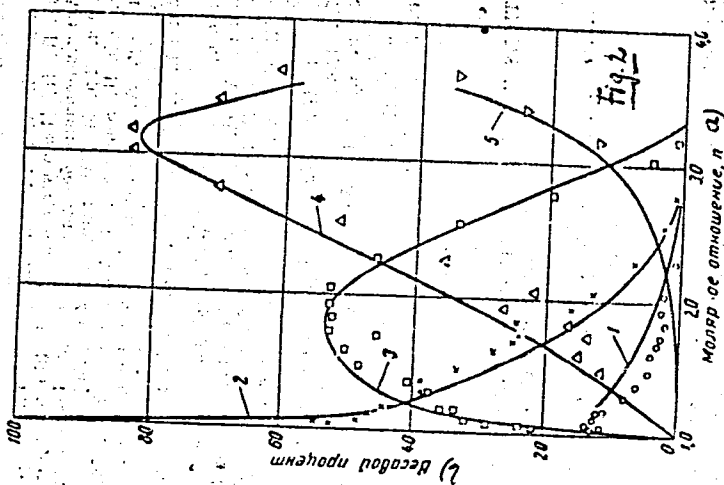
ASSOCIATION: Ural'skiy filial Akademii nauk SSSR, Institut khimii
Sverdlovsk
(Ural Branch of the Academy of Sciences USSR, Institute
of Chemistry, Sverdlovsk)

SUBMITTED: April 25, 1957

Text to Fig. 2: 1: Benzene; 2: Isopropyl Benzene; 3: Diisopropyl Benzene;
4: Triisopropyl Benzene; 5: Tetraisopropyl Benzene; a) Molar Ratio n;
b) Percent by Weight.

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S/076/60/034/007/010/042/XX
B004/B068



Card 6/6

BABIN, Ye.P.; PLYUSNIN, V.G.; NASAKINA, M.I.

Effect of the aluminum chloride content on the relation between
constants of the rate of formation of isopropylbenzenes. Izv.Sib.
otd. AN SSSR no.3:50-57 '60. (MIRA 13:10)

1. Ural'skiy filial AN SSSR.
(Cumene) (Aluminum chloride)

S/076/60/034/008/015/039/XX
B015/B063

AUTHORS: Babin, Ye. P., Plyusnin, V. G., Nasakina, M. I., and Rodigin, N. M.

TITLE: Rules of Substitution of Hydrogen Atoms in the Benzene Ring by Alkyl Groups. XI. Ratio Between the Constants of the Rate of Formation of Isopropyl Benzenes and the Equations for the Composition of the Alkylation Products of Diisopropyl Benzene With Propylene in the Presence of Aluminum Chloride

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 8, pp. 1671 - 1676

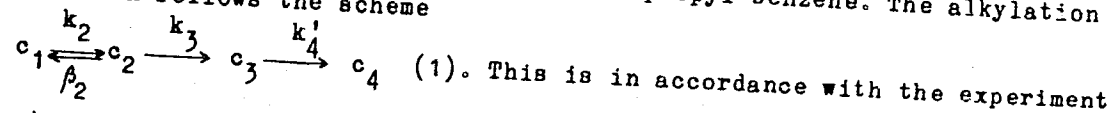
TEXT: The authors have shown in Ref.1 that the alkylation of benzene with propylene in the presence of aluminum chloride is a consecutive four-stage reaction, of which the first, the second, and the fourth are reversible. The reversibility of the first stage was demonstrated by the alkylation of monoisopropyl benzene with propylene in the presence of aluminum chloride. The experiments were performed at 60°C (Ref.2). To study the behavior of diisopropyl benzene under equal conditions, the authors

Card 1/4

Rules of Substitution of Hydrogen Atoms in the Benzene Ring by Alkyl Groups. XI. Ratio Between the Constants of the Rate of Formation of Isopropyl Benzenes and the Equations for the Composition of the Alkylation Products of Diisopropyl Benzene With Propylene in the Presence of Aluminum Chloride

S/076/60/034/008/015/039/XX
B015/B063

alkylated this compound with propylene at 60°C, and added 0.03 mole of AlCl₃ per mole of diisopropyl benzene. They used a diisopropyl fraction composed of 70% m-isomer and 30% p-isomer; $d_4^{20} = 0.8505$; $n_D^{20} = 1.4898$. The fraction boiled between 198° and 212°C. The alkylation was carried out in a three-necked flask with a reflux condenser and a stirrer. The average flow rate of propylene was 150 l/h per kg of alkyl benzene. The alkylation product was distilled, and it was found that alkylation is a reversible, consecutive reaction since at low molar ratios, monoisopropyl benzene is formed as a dealkylation product of diisopropyl benzene. The alkylation reaction follows the scheme



since the reaction $c_0 \rightleftharpoons c_1 \rightleftharpoons c_2 \rightarrow c_3 \rightleftharpoons c_4$ actually takes place. k_2 and k_3

Card 2/4

Rules of Substitution of Hydrogen Atoms in the Benzene Ring by Alkyl Groups. XI. Ratio Between the Constants of the Rate of Formation of Isopropyl Benzenes and the Equations for the Composition of the Alkylation Products of Diisopropyl Benzene With Propylene in the Presence of Aluminum Chloride

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B015/B063

are constants referring to the direct alkylation reaction; k'_4 is a generalized rate constant of the direct and reversible reaction, whereas the reversible dealkylation reaction of diisopropyl benzene has the rate constant β_2 . The following ratios were found for these constants:

$\beta_2 : k_2 : k_3 : k'_4 = 0.14 : 1 : 0.029 : 0.0013$, wherefrom the equations for the composition of the system were derived;

$$c_1 = 14.0 (0.894 \exp(-0.025 \text{ kt}) - 0.894 \exp(-1.1435 \text{ kt}));$$

$$c_2 = 87.13 \exp(-0.025 \text{ kt}) - 12.82 \exp(-1.1435 \text{ kt});$$

$$c_3 = 2.9 [36.89 \exp(-0.0013 \text{ kt}) - 36.78 \exp(-0.025 \text{ kt}) + 0.112 \exp(-1.1435 \text{ kt})];$$

$$c_4 = 100 - \sum_{i=1}^3 c_i. \text{ It is shown that the equations for the composition of}$$

Card 3/4

Rules of Substitution of Hydrogen Atoms in the Benzene Ring by Alkyl Groups. XI. Ratio Between the Constants of the Rate of Formation of Isopropyl Benzenes and the Equations for the Composition of the Alkylation Products of Diisopropyl Benzene With Propylene in the Presence of Aluminum Chloride

S/076/60/034/008/015/039/XX
B015/B063

the systems benzene-propylene and monoisopropyl benzene-propylene may be used to calculate the alkylation of diisopropyl benzene with propylene if the monoisopropyl benzene disappears from the system. The ratios obtained for the rate constants of the systems considered were similar. The mean value of the ratio between the rate constants of the formation of isopropyl benzenes shows that the reactivity of isopropyl benzene in the alkylation reaction is 2.24 times higher than that of benzene. The reactivity of diisopropyl benzene is very low as compared to that of benzene. There are 1 figure, 4 tables, and 5 Soviet references.

ASSOCIATION: Akademiya nauk SSSR Ural'skiy filial Institut khimii
(Ural Branch of the Academy of Sciences USSR, Institute of Chemistry)

SUBMITTED: March 24, 1958

Card 4/4

BUTINA, I.V.; PLYUSNIN, V.G.

Separation of phthalic acids by salting out and sublimation. Izv.
Sib.otd.AN SSSR no.6:65-71 '60. (MIRA 13:9)

1. Ural'skiy filial AN SSSR.
(Phthalic acid)

BABIN, Ye.P.; PLYUSNIN, V.G., ALEKSEYEVA, I.A.

Kinetics of the formation of alkylbenzene isomers during the
alkylation process. Izv.Sib.otd.AN SSSR no.8:75-83 '60.
(MIRA 13:9)

1. Ural'skiy filial AN SSSR.
(Benzene) (Alkylation)

RABIN, Ye.P.; PLYUSNIN, V.G.; NASAKINA, M.I.; RODIGIN, N.M.

Regularities of the substitution of hydrogen atoms in the benzene nucleus by alkyl groups. Part 11. Zhur. fiz. khim. 34 no.8:1671-1676 Ag '60. (MIRA 13:9)

1. Akademiya nauk SSSR, Ural'skiy filial, Institut khimii.
(Alkylation) (Propene) (Benzene)

BABIN, Ye.P.; PLYUSHIN, V.G.; NASAKINA, M.I.; RODIGIN, N.M.

Alkylation of diisopropylbenzene by propylene in the presence of
aluminum chloride. Izv.Sib.otd.AN SSSR no.12:59-64 '59.
(MIRA 13:5)

А. Institut obshchey i neorganicheskoy khimii im.N.S.Kurnakova
AN SSSR i Institut neorganicheskoy khimii Sibirskogo otdeleniya
AN SSSR.

(Benzene) (Propylene) (Alkylation)

BABIN, Ye.P., PLYUSNIN, V.G.; RODIGIN, N.M.; ZELENITSOVA, M.I.

Reversible sequential reactions in the propylation of
diisopropylbenzene with aluminum chloride. Izv.Sib.otd.AN SSSR
no.5:66-72 '60. (MIRA 13:7)

1. Ural'skiy filial AN SSSR.
(Benzene) (Propylation)

RODIGIN, N.M.; RABIN, Ye.P.; PLYUSNIN, V.G. (Sverdlovsk)

Correlations in the substitution of hydrogen atoms by alkyl groups
in the benzene ring. Zhur.fiz.khim. 34 no.5:966-972 My '60. (MIRA 13:7)

1. Ural'skiy filial AN SSSR, Sverdlovsk.
(Benzene) (Alkylation)

BABIN, Ye.P.; PLYUSNIN, V.G.; NASAKINA, M.I.; RODIGIN, N.M.

Regularities in the substitution of benzene hydrogen by
alkyl groups. Part 10. Zhur.fiz.khim. 34 no.7:1389-1394
Jl '60. (MIRA 13:7)

1. Ural'skiy filial Akademii nauk SSSR, Institut, Sverdlovsk.
(Substitution(Chemistry)) (Benzene)

PLYUSNIN, V.K., inzh.

Construction of pipe drains of earth dams. Energ. stroi. no.26:46-
50 '61. (MIRA 15:7)

1. Kremenchuggesstroy.
(Hydrcelectric power stations--Drainage) (Pipe, Concrete)

PLYUSNIN, K.P.; PLYUSNINA, A.A.

New data on Proterozoic formations in the eastern slope of the
Southern Urals. Dokl. AN SSSR 162 no.3:640-642 My '65. (MIRA 18:5)

1. Submitted December 10, 1964.

PLYUSNIN, K.P.; PLYUSNINA, A.A.; ZENKOV, I.I.

New data on grapholite slates in the eastern slope of the
Southern Urals. Izv. AN SSSR. Ser.geol. 30 no.11:121-124
N. 65.
(MIRA 18:12)

1. Ural'skoye geologicheskoye upravleniye, Sverdlovsk. Submitted
December 23, 1964.

PLYUSNIN, K.P.; PLYUSNINA, A.A.

Lower Carboniferous stratigraphy of the Magnitogorsk synclinorium.
Mat.po geol.i pol.isko.Urala no.10:75-87 '62. (MIRA 16:2)
(Ural Mountains--Geology, Stratigraphic)

PLUSNINA, A. A.

The organization of lubrication activities at coal industry enterprises. Moskva, Ugletekhizdat, 1948. 195 p. (49-22825)

TN813.P55

PLYUSNINA, I.I.

Infrared absorption spectra of beryllium minerals. *Geokhimiia*
no.2:158-173 F '63. (MIRA 16:9)

1. Geological Faculty of the Lomonosov State University, Moscow.

PLYUSNINA, I.I.

Results of the study of infrared absorption spectra of the ring
silicate series. Part 3. Zhur.strukt.khim. 2 no.3:330-336
My-Je '61. (MIRA 15:1)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.
(Silicates--Spectra)

PLYUSNINA, I.I.; KHARITONOV, Yu.A.

Crystal chemical properties and infrared absorption spectra of
borates and borosilicates. Zhur.strukt.khim. 4 no.4:555-568 J1-
AP '63. (MIRA 16:9)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Borates--Absorption spectra) (Borosilicates--Absorption spectra)
(Crystallography)

SOV/70-3-6-20/25

AUTHORS: Plyusnina, I.I. and Boki, G.B.

TITLE: Infra-red Reflection Spectra for Ring Silicates in the Wavelength Interval 7 - 15 μ (Infrakrasnyye spektry otrazheniya kol'tsevykh silikatov v intervale dlin voln 7 - 15 μ)

PERIODICAL: Kristallografiya, 1958, Vol 3, Nr 6, pp 752 - 756 (USSR)

ABSTRACT: Infra-red reflection spectra were measured in the range 7 - 15 μ for slices parallel and perpendicular to the main symmetry axis for single crystals of the minerals: eudialite, catapleite, cordierite, diopside, vorobeite, beryl, aquamarine and tourmaline. (Most of these are reproduced.) Qualitative discussion of the features of the spectra follows. Catapleite and eudialite are compared. For catapleite, cut perpendicular to the optic axis, the first main band of the spectrum is a doublet and for the slice cut parallel to the optic axis a weakly characterised doublet. For eudialite the similar band for the slice perpendicular to the optic axis is a doublet, but for the slice parallel to the optic axis it is a triplet. The second main band in the region of 13-14 μ in both catapleite and eudialite for the slices perpendicular to the optic axis is almost

Card1/2

SOV/70-3-6-20/25
Infra-red Reflection Spectra for Ring Silicates in the Wavelength
Interval 7 - 15 μ

twice as intense as for the slices parallel to the optic axis but its position (wavelength) is the same in both cases. Similar kinds of observations are made for the other minerals but no structural or other conclusions are drawn. There are 4 figures, 1 table and 7 references, 3 of which are Soviet and 4 German.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im.M.V. Lomonosova
(Moscow State University imeni M.V. Lomonosov)

SUBMITTED: August 29, 1958

Card 2/2

BAKAKIN, V. V.; BELOV, ⁴V. V.; PLYUSNINA, I. I.

"The crystal chemistry and infra-red spectra of beryl."

report submitted for 6th Gen Assembly, Intl Union of Crystallography, Rome,
9 Sep 63.

Inst Crystallography, AS USSR, Moscow.

PLYUSNINA, I. I., Candidate Geolog-Mineralog Sci (diss) -- "Investigation of the infra-red transmission and reflection spectra of amular silicates". Moscow, 1959. 15 pp (Moscow Order of Lenin and Order of Labor Red Banner State U im M. V. Lomonosov, Geol Faculty), 120 copies (KL, No 22, 1959, 111)

AUTHORS: Grum-Grzhimaylo, S.V. and Plyushina, L.L. 70-3-2-7/26

TITLE: On the Absorption Spectra of Cobalt Compounds
(O spektrakh pogloshcheniya kobal'tovykh soyedineniy)

PERIODICAL: Kristallografiya, 1958, Vol 3, Nr 2, pp 175 - 181
(USSR).

ABSTRACT: The absorption spectra of the following compounds were measured:

Co(SCN)₂.6H₂O solution in water (1.2g/ 100 ml water)

CoSO₄.7H₂O (2.2g/ 100 ml water)

CoCl₂.6H₂O (1.08g/ 100 ml water)

crystal plates of CoCl₂.6H₂O with the electric vector along

n'_g and n'_m powdered crystals of CoCl₂.6H₂O

powdered crystals of CoCl₂

powdered crystals of CoCl₂.2H₂O

crystals, after long keeping in air, of CoCl₂.6H₂O

..... CoCl₂.2H₂O

Card1/3 CoCl₂

On the Absorption Spectra of Cobalt Compounds

70-3-2-7/26

powdered crystals of Cs_2CoCl_4
 Cs_2CoBr_4
 silica glass, coloured with cobalt

$(\text{NH}_3)[\text{Co}(\text{NO}_2)_6]$
 $[\text{Co}(\text{NH}_3)_5\text{Cl}][\text{NO}_3]_2$
 $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{HSO}_4$
 $[\text{Co}(\text{NH}_3)_4\text{CO}_3]\text{Cl}$
 $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$
 $[\text{Co}(\text{NH}_3)_5\text{Br}]\text{Br}_2$

These compounds contained Co^{2+} four- and six-co-ordinated
 and Co^{3+} six-co-ordinated ions. Common features in the
 absorption curves due to these cations are identified.
 Measurements were made between 3 000 and 11 000 Å.

Card 2/3

On the Absorption Spectra of Cobalt Compounds

70-3-2-7/26

There are 3 figures, 1 table and 19 references, 13 of which are Soviet, 4 English and 2 German.

ASSOCIATION: Institut kristallografi AN SSSR
(Institute of Crystallography, Ac.Sc. USSR)

SUBMITTED: May 9, 1957

Card 3/3

PLYUSNINA, I.I.; BOKIY, G.B.

Infrared reflection spectra of ring-type silicates in the
7 - 15 range. Kristallografiia 3 no.6:752-756 '58.
(MIRA 12:2)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomono-
sova.

(Silicates--Spectra)

GRUM-GRZHIMAYLO, S.V.; PLYUSNINA, I.I.

Absorption spectra of cobalt compounds. Kristallografiia 3 no.2:
175-181 '58. (MIRA 11:6)

1. Institut kristallografii AN SSSR.
(Cobalt compounds--Spectra)

USSR / Cultivated Plants. Commercial, Oleaceous,
Sugar Bearing.

M-4

Abs Jour : Ref Zhur - Biologiya, No 2, 1959, No. 6351

Author : Plyusnina, O. P.

Inst : ~~All-Union~~ Scienc. Res. Inst. of Oleaceous
and Essential Oil Crops

Title : The Effect on the Sunflower Yield of Applying
Organic-Mineral Mixtures Simultaneously with
Sowing

Orig Pub : V sb.: Kratkiy otchet o nauchno-izsled. rabote
Vses. n.-i. in-ta maslichn. i efiro maslichn.
kul'tur za 1956 g. Krasnodar, "Sov. Kuban'",
1957, 236-237

Abstract : The following fertilizer variants were tested:
1) 10 t/ha of manure introduced prior to fall
plowing, 2) P8 in the form of P_c, 3) 3 cwt/ha

Card 1/2

RUBACHEV, Georgiy Nikolayevich; FATKULLIN, Mukhtar Khurmatovich; KHANANYAN, Melik Maiorovich; PLYUSNINA, Ol'ga Pavlovna; KOVALEVA, A.A., redaktor; POLOSINA, A.S., ~~tekhnicheskii~~ ^{tekhnicheskii} redaktor.

[Advanced practice in using submerged electric pumps] Peredovoi opyt primeneniia pogrushnykh elektronasosov. Moskva, Gos.naучo-tekhn. izd-vo neftianoi i gorno-toplivnoi lit-ry, 1956. 52 p. (MLRA 9:4)
(Petroleum--Pumping)

GUZANOVA, M.A., meditsinskaya sestra; KUZNETSOV, S.M.; SIGAYEVA, A.N.
SAFIULLINA, A.K.; BLATOVA, N.A., starshaya meditsinskaya sestra;
LEBEDEVA, M.A.; FILIPPOV, V.V.; SOKOLOVA, V.I.; PLYUSHINA, P.K.

Nurses' councils. Med.sestra no.6:59-64 Je '62. (MIRA 15:8)

1. Predsedatel' Soveta meditsinskikh sester pri Tyumenskoy oblastnoy bol'nitse (for Guzanova). 2. Chlen Krayevogo komiteta profsoyuza meditsinskikh rabotnikov, Krasnodar (for Kuznetzov). 3. Predsedatel' Soveta meditsinskikh sester Leninogorskoy gorodskoy bol'nitsy Tatarskoy ASSR (for Sigayeva). 4. Zamestitel' glavnogo vracha po lechebnoy chasti Leninogorskoy gorodskoy bol'nitsy, Tatarskoy ASSR (for Safiullina). 5. Glavnyy vrach bol'nitsy No.6.g. Kamenska-Ural'skogo Sverdlovskoy oblasti (for Lebedeva).
(NURSES AND NURSING)

PLYUSHINA, Z.A.; TROPINA, L.P.; FEDOROVA, V.S.

Effect of sowing time on the yield and ascorbic acid content of
rhubarb and dock. Trudy TSSBS no.7:154-159 '64. (MIRA 17:11)

KOTLYAROV, I.I., prof.; PLYUT, Ye.F., vrach (Krasnoyarsk, 20, ul. Diksora, d.7., kv. 2); RITTER, A.Ya.; ROMANOVA, O.V. (Krasnoyarsk, 20, ul. Diksora, d.7., kv. 2)

Treatment of radiation injuries of the skin with fresh autofibrin films. Vop. onk. 10 no.10:97-100 '64. (MIRA 18:8)

1. Iz kafedry biokhimii (zav. - prof. I.I.Kotlyarov) Krasnoyarskogo meditsinskogo instituta (rektor - dotsent P.G.Podzolkev) i Krasnoyarskogo krayevogo onkologicheskogo dispansera (zav. radiologicheskim otdeleniyem - vrach Ye.F.Plyut) Adres Kotlyarova i Rittera: Krasnoyarsk, ul. Karla Marksa, 124, Kafedra biokhimii Krasnoyarskogo meditsinskogo instituta.

POLAND/Laboratory Equipment. Apparatus.

F

Abs Jour: Ref Zhur-Khimiya, No 21, 1958, 70665.

Author : Plyuta

Inst : Not given.

Title : A Phase- Contrast Microscope for Work in Transmitted Light.

Orig Pub: Pomiary, automat., kontrola, 1957, 3, No 12, 437-478.

Abstract: The importance of optical properties, form, size and location of phase plates for the work of a phase contrast microscope is discussed. The method for the preparation of phase plates are furnished. Part 3, see RzhKhim, 1958, 53551.

Card : 1/1

RUZHINSKIY, M.B.; PLYUTA, M.V.

Semi-automatic device for cutting the ends of pipes and fittings.
Stroi. truboprov. 9 no.8:38-39 Ag '64. (MIRA 17:12)

1. UralNITI, Chelyabinsk (for Ruzhinskiy). 2. Stroitel'no-
montazhnoye upravleniye No.6 tresta Nefteprovodmontazh, Chelyabinsk
(for Plyuta).

PLYUTA, O.K.; MASLYUK, A.I., agronom

Spread of the shield bug infestation is under control. Zashch. rast.
ot vred. i bol. 3 no.1:31-33 Ja-P '58. (MIRA 11:3)

1. Starshiy agronom-entomolog Rostovskogo otryada zashchity rasteniy
(for Plyuta). 2. Kolkhoz imeni Dzerzhinskogo, Aleksandrovskogo rayona,
Rostovskoy oblasti (for Maslyuk).
(Eurygastera)

PLYUTA, V. (Vladivostok)

In the struggle for the quality of merchandise. Sov. torg. 35 no.9:
31-32 S '62. (MIRA 16:2)

(Maritime Territory—Manufactures)
(Quality control)

GRECHIKHIN, L.I.; MIN'KO, L.Ya.; PLYUTA, V.Ye.

Plasma stream in a pulse discharge. Opt. i spektr. 12 no.1:120-
121 Ja '62. (MIRA 15:2)

(Electric discharges)
(Plasma (Ionized gases))